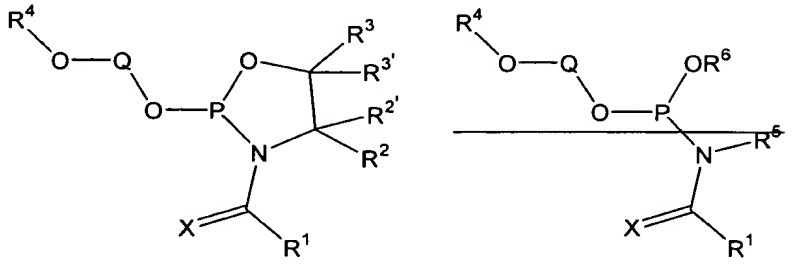
CLAIM AMENDMENTS

1. (Currently Amended) A compound of the formula:



(I) ~~or~~ ~~(II)~~,

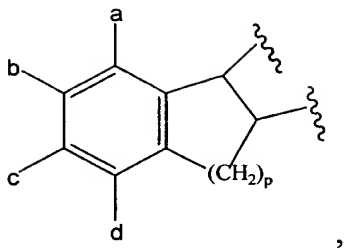
wherein:

R^1 is an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, or an aralkyl, wherein R^1 is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of R^7, OR^7, SR^7, NR^8COR^7, NR^8CSR^7, $NR^8CO_2R^7$, $NR^8C(O)SR^7$, $NR^8CS_2R^7$, O_2CR^7, S_2CR^7, $SCOR^7$, $OCSR^7$, SO_2R^7, OSO_2R^7, $NR^8SO_2R^7$, CN, NO_2, N_3, and a halogen, wherein R^7 is an alkyl, an aryl or an aralkyl, wherein R^7 is unsubstituted or substituted with one or more halogen atoms, which are the same or different, and R^8 is H or an alkyl;

R^2 and $R^{2'}$ are the same or different and each is H, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, or an aralkyl, wherein R^2 is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of OR^7, CN, NO_2, N_3, and a halogen;

R^3 and $R^{3'}$ are the same or different and each is H, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, or an aralkyl, wherein R^3 is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of a trialkylsilyl, an aryldialkylsilyl, an alkyldiarylsilyl, CN, NO_2, N_3, halogens, OR^7, $P(O)(OR^7)(OR^8)$, COR^9, CSR^9, CO_2R^9, $COSR^9$, $CSOR^9$, $CONR^8R^9$, $CSNR^8R^9$, SO_2R^9, and $SO_2NR^8R^9$, wherein R^9 is H, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aralkyl, or an aryl, wherein R^9 is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of CN, NO_2, N_3, and a halogen; or

R^2 and R^3, $R^{2'}$ and R^3, R^2 and $R^{3'}$, or $R^{2'}$ and $R^{3'}$, together with the carbon atoms to which they are bonded, ~~comprise~~ form a cyclic substituent of the formula:



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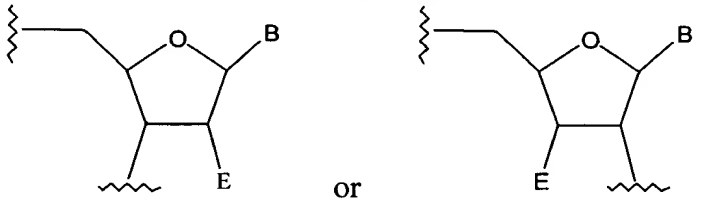
wherein p is an integer from 0-6 and a-d are the same or different and each is selected from the group consisting of H, an alkyl, a nitro, an amino, a hydroxy, a thio, a cyano and a halogen;

R^4 is a protecting group or a solid support;

~~R^5 is H or an alkyl, which is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of OR^7, CN, NO_2, N_3, and a halogen;~~

~~R^6 is a protecting group, an amidoalkyl in which the nitrogen atom is 2, 4, or 5 carbon atoms removed from the oxygen of OR^6, an alkyl, an alkyl ketone, an alkenyl, an alkynyl, a cycloalkyl, an aryl, or an aralkyl, wherein R^6 is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of CN, NO_2, N_3, and a halogen;~~

Q is a nucleoside, an oligonucleotide ~~comprising~~ having a nucleoside, or an oligomer ~~comprising~~ having a nucleoside, wherein ~~said~~ the nucleoside is of the formula:



wherein:

B is a labeling group, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, a heteroaryl, a heterocycloalkyl, an aralkyl, an amino, an alkylamino, a dialkylamino, a purine, a pyrimidine, adenine, guanine, cytosine, uracil, or thymine, wherein B is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of a protecting group, R^{11}, OR^{11}, NHR^{11}, $NR^{11}R^{12}$, CN, NO_2, N_3, and a halogen, wherein R^{11} and R^{12} are the same or different and each is H, a protecting group, or an alkyl; and,

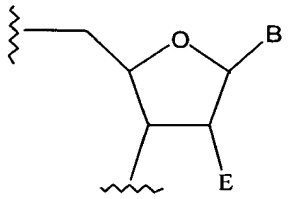
E is H, a halogen, OR^{13}, NHR^{13}, or $NR^{13}R^{14}$, wherein R^{13} and R^{14} are the same or different and each is H, a protecting group, an alkyl, or an acyl; and

X is O, S, or Se.

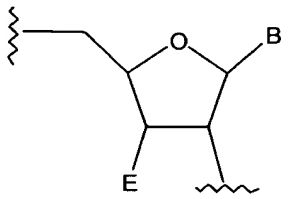
wherein the labeling group is a carboxyl to which is appended, via an amide linker, biotin, cholesterol, fluorenylmethoxycarbonyl (Fmoc), or trifluoroacetyl.

2. (Canceled)

3. (Currently Amended) The compound of claim 1, wherein Q is a nucleoside of the formula:



or

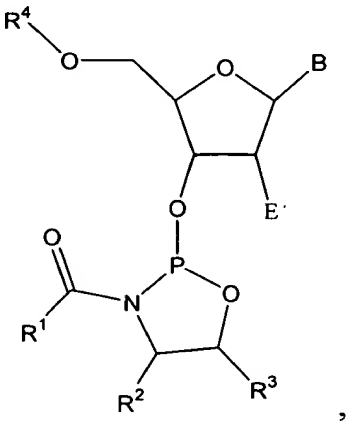


wherein B and E are as defined in claim 1~~:~~

~~B is a labeling group, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, a heteroaryl, a heterocycloalkyl, an aralkyl, an amino, an alkylamino, a dialkylamino, a purine, a pyrimidine, adenine, guanine, cytosine, uracil, or thymine, wherein B is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of a protecting group, R^{11}, OR^{11}, NHR^{11}, $NR^{11}R^{12}$, CN, NO_2, N_3, and a halogen, wherein R^{11} and R^{12} are the same or different and each is H, a protecting group, or an alkyl; and~~

~~E is H, a halogen, OR^{13}, NHR^{13}, or $NR^{13}R^{14}$, wherein R^{13} and R^{14} are the same or different and each is H, a protecting group, an alkyl, or an acyl~~.

4. (Currently Amended) The compound of claim 1, wherein ~~said~~ the compound is of the formula:



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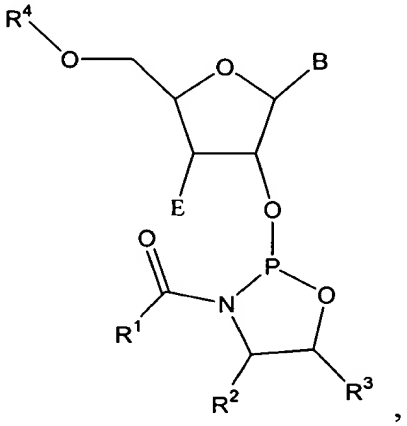

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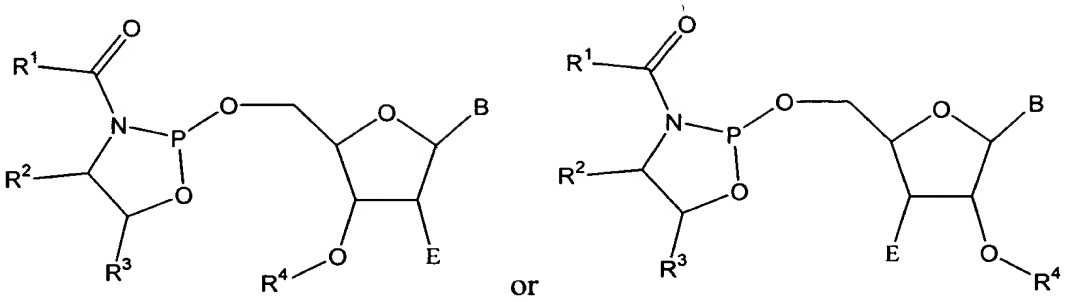
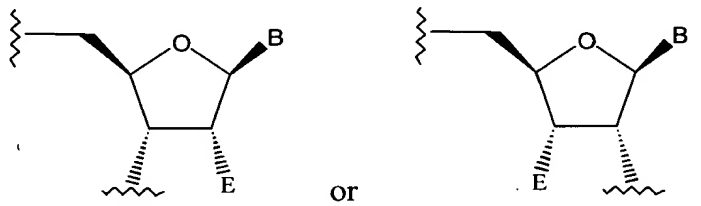


or

wherein R^1-R^4, B, and E are as defined in claim 1.

5. (Currently Amended) The compound of claim 1, wherein Q is an oligonucleotide ~~comprising~~ having a nucleoside, a nucleoside, or an oligomer ~~comprising~~ having a nucleoside, wherein ~~said~~ the nucleoside is of the formula:



or

wherein B and E are as defined in claim 1~~:~~

~~B is a labeling group, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, a heteroaryl, a heterocycloalkyl, an aralkyl, an amino, an alkylamino, a dialkylamino, a purine, a pyrimidine, adenine, guanine, cytosine, uracil, or thymine, wherein B is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of a protecting group, R^{11}, OR^{11}, NHR^{11}, $NR^{11}R^{12}$, CN, NO_2, N_3, and a halogen, wherein R^{11} and R^{12} are the same or different and each is H, a protecting group, or a C_1-C_6 alkyl; and~~

~~E is H, a halogen, OR^{13}, NHR^{13}, or $NR^{13}R^{14}$, wherein R^{13} and R^{14} are the same or different and each is H, a protecting group, an alkyl, or an acyl~~.

6. (Original) The compound of claim 5, wherein B is a purine, a pyrimidine, adenine, guanine, cytosine, uracil, or thymine, wherein B is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of a protecting group, R^{11}, OR^{11}, NHR^{11}, $NR^{11}R^{12}$, CN, NO_2, N_3, and a halogen, wherein R^{11} and R^{12} are the same or different and each is H, a protecting group, or an alkyl.

7. (Previously Presented) The compound of claim 1, wherein R^1 is an alkyl, which is unsubstituted or substituted with one or more substituents, which are the same or

different, selected from the group consisting of fluorine, OR^7, and SR^7, wherein R^7 is an alkyl or an aryl.

8. (Original) The compound of claim 7, wherein R^3 is a vinyl group or a phenyl group.

9. (Previously Presented) The compound of claim 1, wherein R^4 is a 4,4'-dimethoxytrityl group.

10. (Canceled)

11. (Canceled)

12. (Currently Amended) A method of preparing a polymer, ~~said~~ the method comprising the steps of:

(a) reacting a nucleophile ~~that can displace the N-acyl group of an N-acylphosphoramidite~~ of the formula R^4—O—Q—OH with the N-acylphosphoramidite of claim 1, wherein R^4 ~~is a protecting group~~ and Q are as defined in claim 1, to produce an adduct of ~~said~~ the N-acylphosphoramidite and ~~said~~ the nucleophile, ~~said~~ the adduct comprising a tricoordinated phosphorus atom;

(b) reacting ~~said~~ the adduct with a reagent selected from the group consisting of oxidizing agents, sulfurizing agents, and selenizing agents, to produce a product, wherein ~~said~~ the tricoordinated phosphorus atom is converted into a phosphorus atom with a valence of greater than three;

(c) removing the protecting group R^4 from the product; and

(d) optionally repeating steps (a) through (c) one or more times until a polymer of specified length is obtained.

13. (Original) The method of claim 12, further comprising the step of cleaving the bond linking the organic moiety to the non-bridging phosphate, phosphorothioate or phosphoroselenoate oxygen atom in the product obtained in step (c) or (d).

14. (Original) The method of claim 13, wherein the bond linking the organic moiety to the non-bridging phosphate, phosphorothioate or phosphoroselenoate oxygen atom is cleaved chemically.

15. (Original) The method of claim 13, wherein the bond linking the organic moiety to the non-bridging phosphate, phosphorothioate or phosphoroselenoate oxygen atom is cleaved thermally.

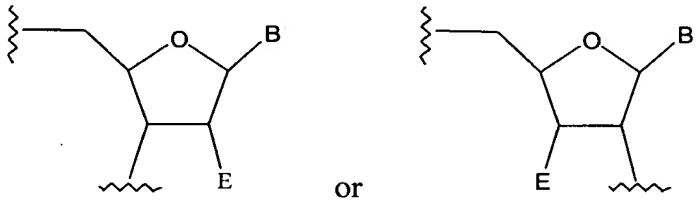
16. (Currently Amended) The method of claim 12, wherein ~~said~~ the nucleophile is attached to a solid support.

17. (Currently Amended) The method of claim 12, wherein ~~said~~ the nucleophile is of the formula:

$$R^4—O—Q—OH$$

wherein:

Q is a nucleoside, oligonucleotide ~~comprising~~ having a nucleoside, or an oligomer ~~comprising~~ having a nucleoside, wherein ~~said~~ the nucleoside is of the formula:



wherein:

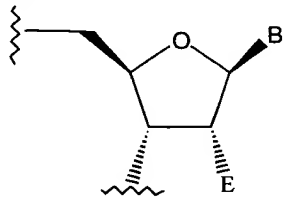
B is a labeling group, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, a heteroaryl, a heterocycloalkyl, an aralkyl, an amino, an alkylamino, a dialkylamino, a purine, a pyrimidine, adenine, guanine, cytosine, uracil, or thymine, wherein B is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of a protecting group, R^{11}, OR^{11}, NHR^{11}, $NR^{11}R^{12}$, CN, NO_2, N_3, and a halogen, wherein R^{11} and R^{12} are the same or different and each is H, a protecting group, or an alkyl; and

E is H, a halogen, OR^{13}, NHR^{13}, or $NR^{13}R^{14}$, wherein R^{13} and R^{14} are the same or different and each is H, a protecting group, an alkyl, or an acyl; and

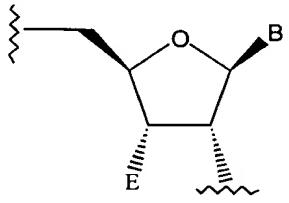
R^4 is a solid support.

18. (Canceled)

19. (Currently Amended) The method of claim 17, wherein Q is a nucleoside, an oligonucleotide ~~comprising~~ having a nucleoside, or an oligomer ~~comprising~~ having a nucleoside, wherein ~~said~~ the nucleoside is of the formula:

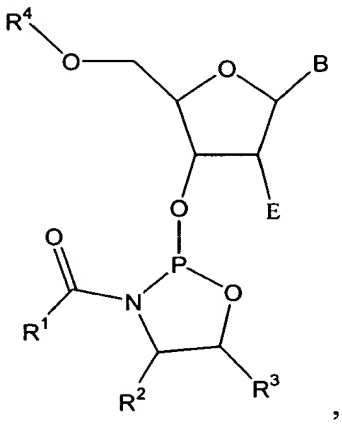


or



wherein B and E are as defined in claim 17.

20. (Currently Amended) The method of claim 12, wherein ~~said~~ the N-acylphosphoramidite is of the formula:



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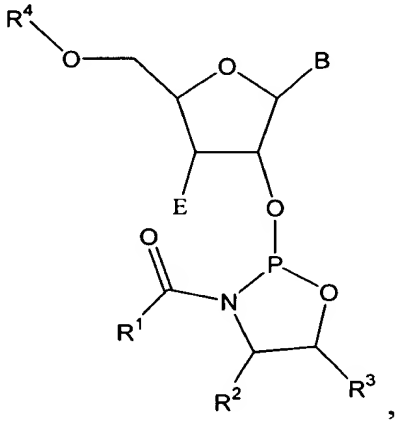

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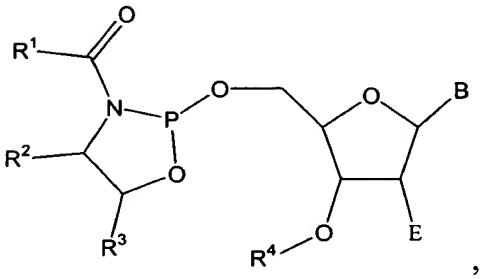

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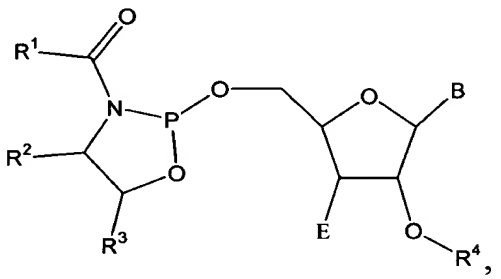


,

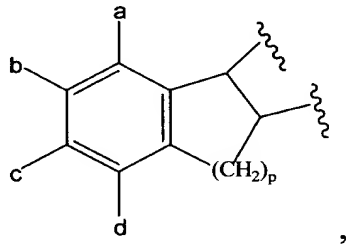
wherein:

R^1 is an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, or an aralkyl, wherein R^1 is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of R^7, OR^7, SR^7, NR^8COR^7, NR^8CSR^7, $NR^8CO_2R^7$, $NR^8C(O)SR^7$, $NR^8CS_2R^7$, O_2CR^7, S_2CR^7, $SCOR^7$, $OCSR^7$, SO_2R^7, OSO_2R^7, $NR^8SO_2R^7$, CN, NO_2, N_3, and a halogen, wherein R^7 is an alkyl, an aryl or an aralkyl, wherein R^7 is unsubstituted or substituted with one or more halogen atoms, which are the same or different, and R^8 is H or an alkyl;

R^2 is H, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, or an aralkyl, wherein R^2 is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of OR^7, CN, NO_2, N_3, and a halogen;

R^3 is H, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, or an aralkyl, wherein R^3 is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of a trialkylsilyl, an aryldialkylsilyl, an alkyldiarylsilyl, CN, NO_2, N_3, a halogen, OR^7, $P(O)(OR^7)(OR^8)$, COR^9, CSR^9, CO_2R^9, $COSR^9$, $CSOR^9$, $CONR^8R^9$, $CSNR^8R^9$, SO_2R^9, and $SO_2NR^8R^9$, wherein R^9 is H, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aralkyl, or an aryl, wherein R^9 is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of CN, NO_2, N_3, and a halogen; or

R^2 and R^3, together with the carbon atoms to which they are bonded, ~~comprise~~ form a cyclic substituent of the formula:



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wherein p is an integer from 0-6 and a-d are the same or different and each is selected from the group consisting of H, an alkyl, a nitro, an amino, a hydroxy, a thio, a cyano and a halogen;

R^4 is a protecting group or a solid support;

B is a labeling group, an alkyl, an alkenyl, an alkynyl, a cycloalkyl, an aryl, a heteroaryl, a heterocycloalkyl, an aralkyl, an amino, an alkylamino, a dialkylamino, a purine, a pyrimidine, adenine, guanine, cytosine, uracil, or thymine, wherein B is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of a protecting group, R^{11}, OR^{11}, NHR^{11}, $NR^{11}R^{12}$, CN, NO_2, N_3, and a halogen, wherein R^{11} and R^{12} are the same or different and each is H, a protecting group, or an alkyl; and,

E is H, a halogen, OR^{13}, NHR^{13}, or $NR^{13}R^{14}$, wherein R^{13} and R^{14} are the same or different and each is H, a protecting group, an alkyl, or an acyl.

21. (Original) The method of claim 20, wherein B is a purine, a pyrimidine, adenine, guanine, cytosine, uracil, or thymine, wherein B is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting

of a protecting group, R^{11}, OR^{11}, NHR^{11}, $NR^{11}R^{12}$, CN, NO_2, N_3, and a halogen, wherein R^{11} and R^{12} are the same or different and each is H, a protecting group, or an alkyl.

22. (Previously Presented) The method of claim 20, wherein R^1 is an alkyl, which is unsubstituted or substituted with one or more substituents, which are the same or different, selected from the group consisting of fluorine, OR^7, and SR^7, wherein R^7 is an alkyl, an aryl, or an aralkyl.

23. (Previously Presented) The method of claim 20, wherein R^3 is a vinyl group, a phenyl, or a benzyl.

24. (Previously Presented) The method of claim 20, wherein R^4 is a 4,4'-dimethoxytrityl group.

25-28. (Canceled)